

## CLAIMS (Original)

1. A luminance control method for a liquid crystal display device, which comprises a liquid crystal panel and a backlight disposed at the back of the liquid crystal panel, for controlling an input level of a video signal to be inputted into the liquid crystal panel to control transmittance of the liquid crystal panel and provide a gray-level display, wherein:

the liquid crystal display device further comprises luminance detecting means for detecting a luminance of the backlight, and

the luminance control method comprises the steps of:

measuring a luminance of light emitted from the backlight through the liquid crystal panel in a plurality of states where the liquid crystal panel has a predetermined transmittance and the backlight has a different luminance, and preliminarily storing the luminance measured in each state associated with the luminance detected by the luminance detecting means;

setting a desired luminance set value of light emitted through the liquid crystal panel in a state where the liquid crystal panel has a predetermined transmittance;

calculating a luminance to be detected by the luminance detecting means, which is to be the set luminance set value, on the basis of stored luminance in each state; and

controlling the luminance of the backlight so as to be the calculated luminance.

2. The luminance control method according to claim 1, further comprising the steps of:

measuring a luminance of light emitted through the liquid crystal panel in each input level, and preliminarily storing the measured luminance associated with an input level which gives the luminance;

calculating a luminance of light emitted through the liquid crystal panel in each input level and a luminance to be set in each gray level in a case of the luminance set value, on the basis of the stored luminance and input level;

extracting an input level, which gives a luminance substantially equal to the luminance to be set in each gray level, on the basis of the luminance in each calculated input level and the luminance to be set in each gray level, and storing the extracted input level associated with a gray level; and

controlling the transmittance of the liquid crystal panel in a gray level associated with the input level of the video signal.

3. The luminance control method according to claim 1, further comprising the steps of:

measuring a luminance of light emitted through the liquid crystal panel in each input level;

normalizing each measured luminance, and preliminarily storing each normalized luminance associated with an input level which gives the luminance;

calculating a luminance of light emitted through the liquid crystal panel in each input level and a luminance to be set in each gray level in a case of the luminance set value, on the basis of the stored luminance and input level;

extracting an input level, which gives a luminance substantially equal to a luminance to be set in each gray level, on the basis of the luminance in each calculated input level and the luminance to be set in each gray level, and storing the extracted input level associated with a gray level; and

controlling the transmittance of the liquid crystal panel in a gray level associated with the input level of the video signal.

4. The luminance control method according to any one of claims 1 through 3, wherein the luminance set value is a luminance in a state where the transmittance of the liquid crystal panel is a controllable maximum transmittance.

5. The luminance control method according to any one of claims 1 through 4, wherein one state of the plurality of states is a state where the backlight has a controllable maximum luminance and another state of the plurality of states is a state where the backlight has a controllable minimum luminance.

6. A liquid crystal display device, which comprises a liquid crystal panel and a backlight disposed at the back of the liquid crystal

panel, for controlling an input level of a video signal to be inputted to the liquid crystal panel to control transmittance of the liquid crystal panel and provide a gray-level display, comprising:

luminance detecting means for detecting a luminance of the backlight;

a storage unit for preliminarily storing information in which the luminance detected by the luminance detecting means, in a plurality of states where the liquid crystal panel has a predetermined transmittance and the backlight has a different luminance is associated with a luminance of light emitted from the backlight through the liquid crystal panel;

accepting means for accepting a desired luminance set value of light emitted through the liquid crystal panel in a state where the liquid crystal panel has a predetermined transmittance;

calculating means for calculating a luminance to be detected by the luminance detecting means, which is to be the luminance set value accepted by the accepting means, on the basis of the information stored in the storage unit; and

luminance control means for controlling the luminance of the backlight so as to be the luminance calculated by the calculating means.

7. The liquid crystal display device according to claim 6, wherein

the storage unit further stores second information on a

luminance of light emitted through the liquid crystal panel in each input level, and

the liquid crystal device further comprises:

second calculating means for calculating a luminance of light emitted through the liquid crystal panel in each input level in a case of the luminance set value accepted by the accepting means, on the basis of the second information;

third calculating means for calculating a luminance to be set in each gray level in a case of the luminance set value accepted by the accepting means;

fourth calculating means for calculating a luminance difference between the luminance to be set in each gray level calculated by the third calculating means and the luminance in each input level calculated by the second calculating means;

storage means for storing an input level, which gives a minimum luminance difference calculated by the fourth calculating means, associated with a gray level; and

control means for controlling the transmittance of the liquid crystal panel in a gray level associated with the input level of the video signal.

8. The liquid crystal display device according to claim 6 or 7, wherein the luminance detecting means has: photoelectric conversion means for converting the luminance of the backlight into an analog-type electric signal having a voltage corresponding to the

luminance of the backlight; and analog-digital conversion means for converting the converted analog-type electric signal into a digital-type electric signal.

9. A computer program for causing a computer to output control information to a liquid crystal display device comprising a liquid crystal panel and a backlight disposed at the back of the liquid crystal panel and causing the computer to control an input level of a video signal to be inputted into the liquid crystal panel to control transmittance of the liquid crystal panel and provide a gray-level display, said computer program comprising the steps of:

causing the computer to store in a storage unit a luminance of the backlight, in a plurality of states where the backlight has a different luminance, associated with a luminance of light emitted from the backlight through the liquid crystal panel;

causing the computer to set a desired luminance set value of light emitted through the liquid crystal panel;

causing the computer to calculate control information for controlling a luminance of the backlight, which is to be the set luminance set value, on the basis of first information stored in the storage unit; and

causing the computer to output the calculated control information to the liquid crystal display device.

10. The computer program according to claim 9, further

comprising the steps of:

causing the computer to store in a storage unit second information on a luminance of light emitted through the liquid crystal panel in each input level;

causing the computer to calculate a luminance of light emitted through the liquid crystal panel in each input level in a case of the inputted luminance set value, on the basis of the stored second information;

causing the computer to calculate a luminance to be set in each gray level in a case of the inputted luminance set value;

causing the computer to calculate a luminance difference between the calculated luminance to be set in each gray level and the calculated luminance in each input level; and

causing the computer to store in the storage unit an input level, which gives a minimum calculated luminance difference, associated with a gray level.